Assessment of Sewerage Management in Feni Town

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Abstract

Sound health and good environment depends on proper Sewerage System. All categories of sewerages probably bear pathogenic organisms that can supply diseases to human and others life. Sewerage system is usually contaminated by showers, dishwashers and clothe washer fecal matters, urine, food particles, rags, paper, kitchen and bathing wastewater from commercial organization and institutions including hospitals, industrial effluents and other urban run-off and agricultural wastes either liquefied or as suspended matter anything else in drain. Assessment of sewerage system in Feni town has been studied and evaluated by analyzing data. Study shows that the sewerage system in Feni town is not designed in proper way. The topographical maps and physical survey methods have been used to find out the present condition of the sewerage systems. The result of the investigation finds ineffective drainage are basically associated with poor maintenance, indiscriminate dumping of refuse and lack of awareness of the stakeholders. The study recommends avoiding open drain based sewerage system and adoption of covered or piped sewage system along with modern technologies.

Key terms: Sewerage; pathogenic; indiscriminate dumping; Feni town

Introduction

Sewerage is the collection and conveyance of municipal wastewater to the point of disposal. The wastewater need to be segregated from the term sewage, the terms "sewage" and "Sewerage" are sometimes interchanged (Li et al, 2014). The urban drainage system should also be deliberated as an important infrastructure in removing both wastewater and rainwater to prevent unhygienic situation and to eliminate damage from flooding. Feni district is the excellent place in terms of geographical

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location. There are many historical places in the Feni district. Feni city does not get the touch of inhabitability indicators yet such as sewerage management system. However, Feni city is ranked second in nation in terms of gross national income (GNI) and possession of health (Mediawiki, 2015). Over time, people come here from different places seems to live and income as well. The swift improvements of the population, the technological and industrial boom have brought much problems and destruction of the environment.

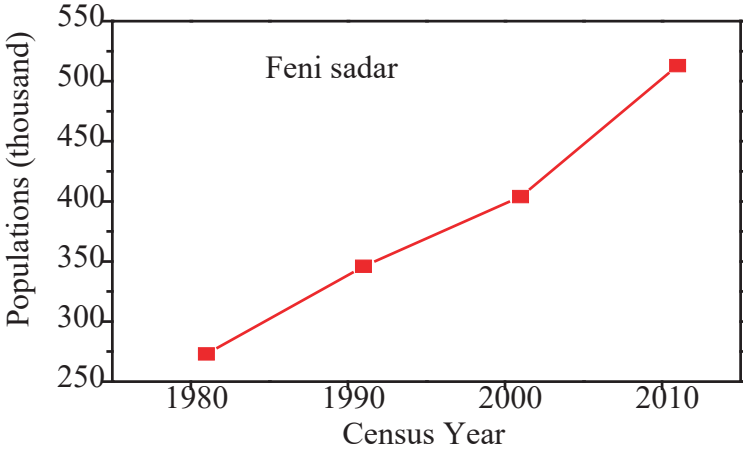

Figure 1: Number of populations in Feni Sadar (Source: BBS, 2011)

Effective management of urban wastewater is a critical problem of the Feni city. On the contrary, providing safe and sufficient drinking water and appropriate sewerage method remains as the challenging tasks for many developing countries particularly so, in urban areas.

Sewage is a complex mixture containing nutrients, suspended solids, pathogens, oxygen's dissolving substances and other contaminants and each has different environment impact (Odetola and Awoniyi, 2007). Environmental health is, according to World Health Organization (WHO), those aspects of human health and diseases that are determined by factors in the environment. It refers to the theory and practice of assessing and controlling factors in the environment that can potentially affects health (WHO, 2016).

The national consultation was planned to obtain views from the participants on the post-2015 development agenda for water and sustainable development in the context of the national needs. The participants were divided into groups to give feedback on the five proposed targets of UN-water. One of them is, 'Reducing untreated wastewater, nutrient pollution and increase wastewater reuse" (Saeed, 2015). The recommended targets are:

I. Sewage: untreated sewerage shall be reduced to 0 (zero) by 2030 in urban areas, while presently 80% of sewerage goes untreated.

II. Solid waste: Unmanaged solid waste shall be reduced to 0 (zero) by 2030 in urban area while presently 98% of solid waste goes unmanaged.
III. Industrial wastewater: Untreated industrial wastewater shall be reduced to 0 (zero) by 2030 while presently 90% waste goes unmanaged.
IV. Wastewater: Untreated wastewater load (mostly nutrient) from agricultural land shall be reduced to 40% by 2030, while presently 85% of wastewater from agricultural lands goes untreated.
V. GW contaminated by Arsenic: Arsenic contaminated GW based water supply shall be reduced to 0 (zero) by 2030, presently 35% of GW based water supply system is arsenic contaminated.
VI. Water pollution: polluted surface water shall be reduced to 0 (zero) by 2020, at present 20% of the surface water it polluted.
According to United Nation Educational, Scientific and Cultural Organization (UNESCO), the global wastewater generation is increasing at an exponential rate, as a result of rapid population growth and urbanization (Zandaryaa, 2011). A large volume of untreated wastewater is dumped directly into our water resources, threatening human health, ecosystems, biodiversity, food security and the sustainability of our water resources. The various components in urban wastewater are shown in Fig 3(Bai et al 2010).

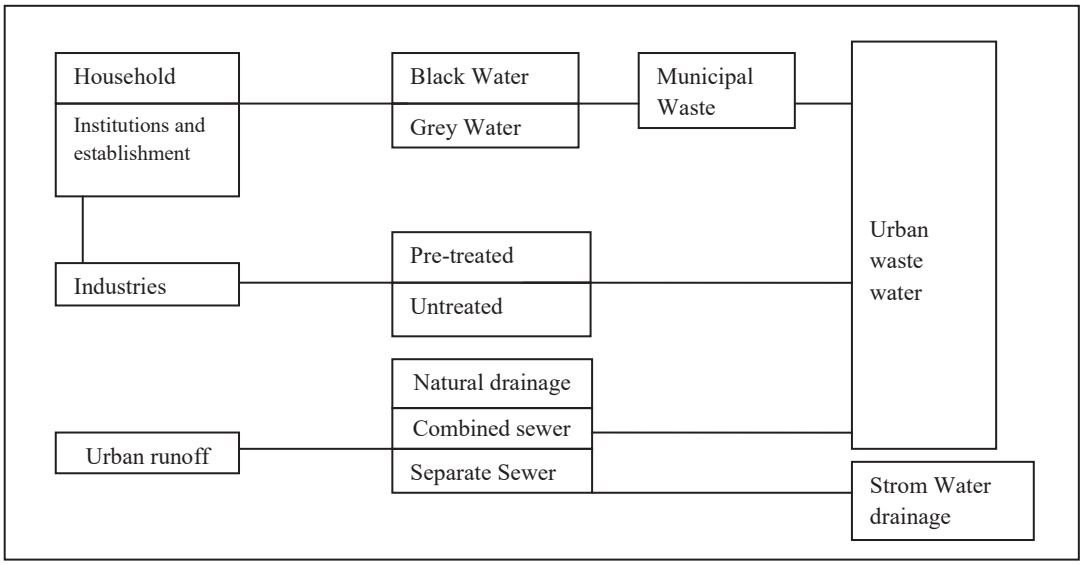

Figure 2: Block diagram of urban wastewater management components.

To maintain a healthy environment, to get healthy people and to achieve maximum development in Feni city, the sewerage infrastructure needs to be improved. It can be noted that Feni city has no planned sewerage system right now. The data shown in Fig. 1 tells us that immediately Feni city starts to build a planned sewerage system with

modern facilities as the population of this city rapidly increases almost linearly with the time frame. Therefore, we are intended to investigate present condition and how to solve this problem to be established Feni as a model city. We report causes and environmental synthesis of miscarriage sewerage system in the Feni city as well. We believe our study will be a one-step forward to build Feni as a modern city with very good living and healthy city. Data for the study were collected by visiting the various sides of town in January to march 2017 to tests the disposal method.

Importance of sewerage management

Following are the importance of proper sewerage management

- To provide a hygienic and healthy Environment
- To increases the aesthesis and property value
- To protect public health
- To build a beautiful & inhabitable Town

Therefore, to establish Feni town as a model city, we are intended to identify existing sewerage system in Feni town and a complete proposal to bind a modern sewerage system. The following are the specific objective of current research:

- Deices faults of existing sewerage system. However, right now Feni town has no sewerage system they use drainage system for sewerage.
- Proposed a complete proposal for sewerage system in this town.

Study Area

The research is focused some roads of selected arias such as "Mohipal, Shahin academy, Rumpur, moddomcharipur, birinchi, barahipur, shanty niketon, lal pol, ducter para, pathanbari, salinaparben, master para.Feni town located in the South-Eastern part of Bangladesh covering a land area of 197.33 and 23.0167° N 91.3917° E

Figure 3: Feni district of Bangladesh

Material and Methods

Our study is based on an analysis of data from Feni city area. The data were collected by two parts.

Part-1:

This part is related to study area observation (visited selected areas of road). Take pictures of various scenarios as it relates to various sewerage conditions. Observation and deliberation with residents were also made and recorded.

Part-2

In this part data were collected from journals, books, official papers etc. Both quantitative and rich in good techniques in data collection and exploration were utilized as main instrument.

Result and Discussion

Blockages in sewerage and flooding

More than often, blockage and flooding are being considered the prime problem for sewerage system. Within the investigation we find out various places is blockages condition in sewerage system. Indiscriminate dumping of refuse is unsightly, dangerous and exposes public to illnesses. Wastes were dumped in ditches and in sewerage. Theses sewerage remains unattended to and thereabout get clogged. This causes blockage of sewerage for the subsequent runoffs and other contents. Due to blockage the road pavement attached to the sewerage is also under threat. Water builds on flood up on the pavement, as a courses causing a wear and tear and with washes of bitumen. Other road components into drains thereabout causing further depreciation and leading to sewerage failures.

Figure 4: Two specimen pictures of blockage in sewerage system in Feni town.

Deficiency of public participation

One of the major obstructions prohibiting the fruitful control of storm runoff measures either by structural or non-structural measures is the absence of public participation in providing accomplishment to urban sewerage problems

Figure 5: The obstruction in the sewerage system created by the daily wastage in Feni town.

Absence of public participation gives room for repetition of earlier errors in tackling sewerage problem and low investments in municipal facilities. It is very difficult in public participation which is the wide dissimilation in socioeconomic levels amongst those living in the town.

Table 1: Socio economic factors in developing countries (Olukanni et al 2014).

Socio-Economic factor	Effect	Consequence
Insufficient environment education of most of the population	Lack of knowledge and care about the impact of trash on streets and in watercourses	Discharge of refuse, sediments and excreta on streets and into watercourses
`social forces of the poorest segment of the population	Illegal occupancy of urban preserved areas.	Deforestation exposure of bare soil, impervious
	Illegal occupancy of urban risk areas.	Landslides production and direct discharge of sediments and refuse into watercourses
		Unacceptable exposure to major floods (life-risking floods)

Public participation in terms of sanitation provides members of the public opportunity to contribute in the policy and decision making process. In this contribution, the place

of planning, motivation, implementation and maintenance of sewerage should be given its rightful place as regards to sustainability.

Effect of Poor Maintenance

This is the biggest problem of sewerage system. The preset sewerage system is traditional, not environmental friendly and done by unskilled labor. It is maintained by hand work. The municipal authority does not use any modern technique or technology such as hydraulics pressure machine. The municipal authority has only one hydraulic pressure machine, which is used for watering. The municipal authority has greatly lack of proper awareness, maintenance knowledge about sewerage system and also it has no expert person on the sewerage management system. The making of sewerages will be a waste when not rightly maintained. The execution of sewerage is assigned not to how effective it is utilized, but also to situation in them. These situations include the presence of waste and the presence of growing leakage.

Figure 6: Sewerage maintenance in Feni town.

Impacts on Health

The objectives of sewerage system are to protect public health, safety and protect the environment. But it is not possible when this system does not work correctly. The wished for level of service should be given for maintenance and operation, which is unavoidable for the protection of public health safety. Sewerage wastewater is mainly included of water together with relatively small concentration of suspended and dissolved organic and inorganic solids. Among the organic substances present in sewage are carbohydrates, lignin, fats, synthetic detergents, proteins and their decomposition products, as well as various natural and synthetic organic chemicals from the process industries. The level of the major constituents of strong medium and weak domestic wastewater. Dissolved solids (TDS), Suspended solids,

Nitrogen, Phosphorus, Chloride, Alkalinity, Grease, Zink, Cu, Mn, Cl and possible levels pathogens are viruses, bacteria, Protozoa, Helminthes etc. (Richard et al, 1983).
Table 2: The Environmental health impacts of the methods are illustrated in (Ladan, 2014).

S/N	Method of sewage disposal	Negative environmental impact
01.	Sewage flow into storm drainage	Air pollution Risk of causing urban flooding Increase waste disposal problems.
02.	Sewage flow into open ground	Create piddles Destroy beauty of surroundings Difficulty of movement
03.	Sewage flow into streams	Killing aquatic animals Water pollution Affects auricular crops produced.
04.	Sewage flow into water pond	Create stagnant water that is breeding area of disease vectors.
05.	Septic Tank system	Minimal negative impact on underground soil micro-organism.

The present condition of Feni town sewerage system is shown below by graphically:

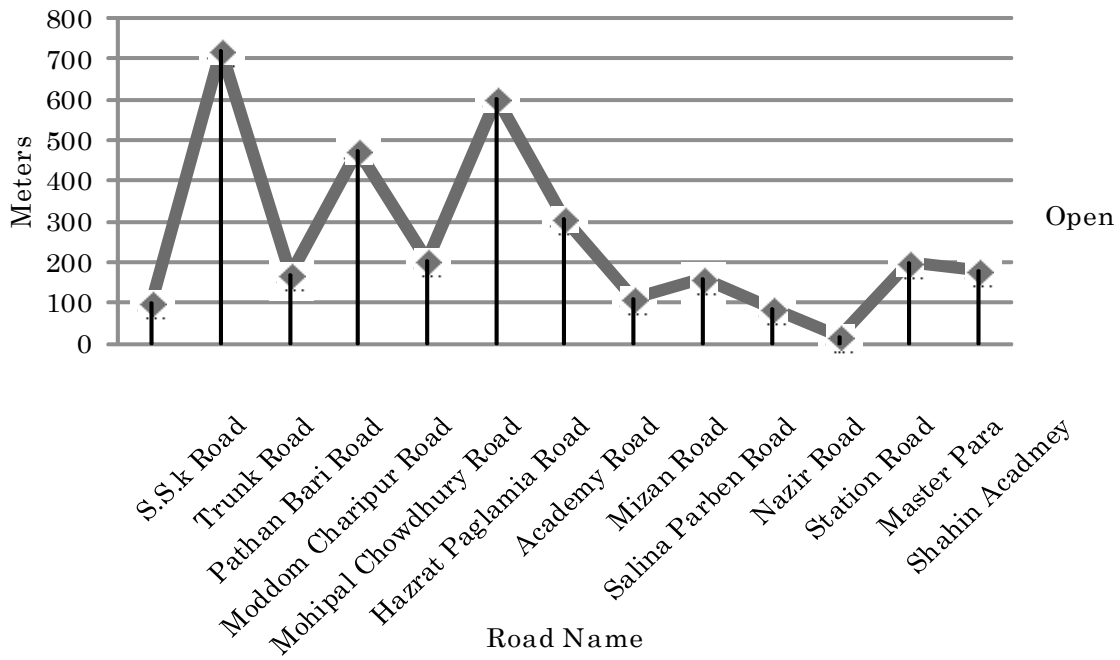

Figure 7: Open sewerage line (meter) in different spots of Feni town.

Open space has been measured by conventional scale with visited selected areas road.

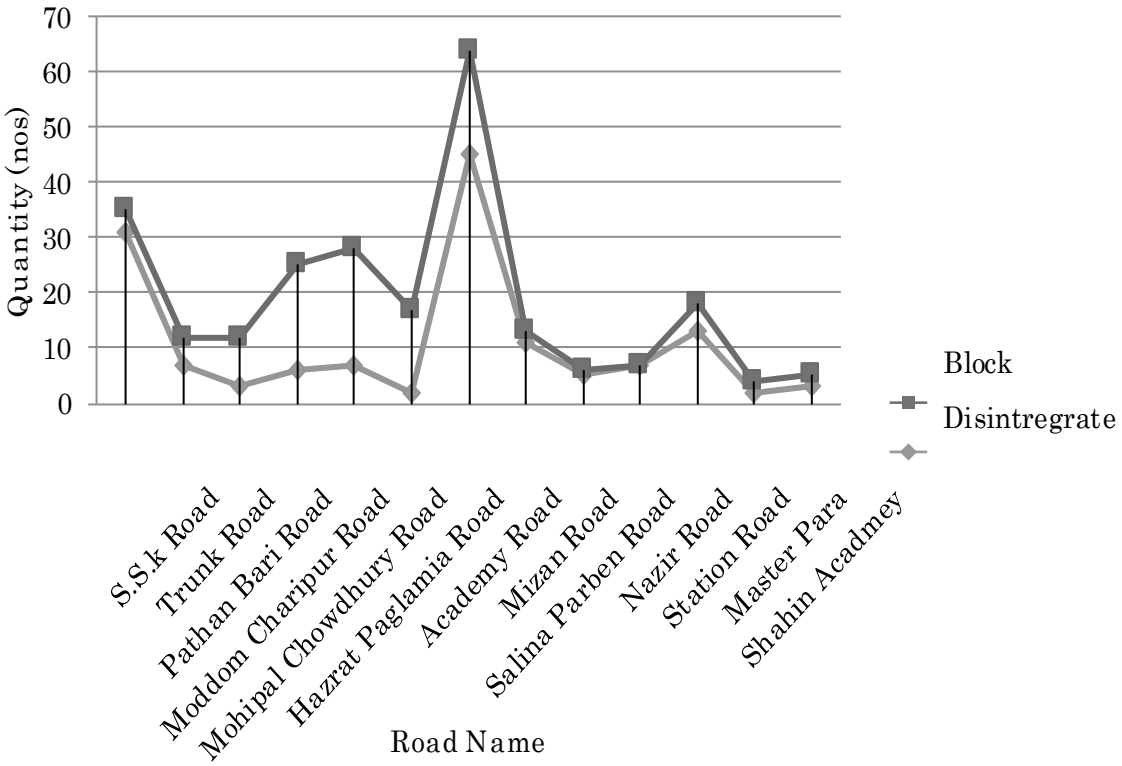

Figure 8: Blockage and disintegrate (quantity) in different spots of Feni town.

Findings

- Low discharge rate
- Nonfunctional at various point
- Poor planning and design
- Poor maintenance system
- No treatment plant

The present existing sewerage system is drainage based sewerage system. This is not qualified and incapable to transfer of wastewater to the disposal points. Therefore, it is difficult to protect healthy environment and to build Feni town as an inhabitable town.

Conclusion

Assessment and detail condition of current sewerage system of Feni town have been analyzed and discussed. The study shows that the open spaces in sewerage in trunk road, middle Charipur and Hazrat Paglamiah road are higher than that of others studied

spots in Feni town. It is well known that the trunk road area is very busy, open sewerage line in that area is not shown sign of good sewerage system in Feni town. However, number of blockages and disintegrated in academy road is higher than that of others spots in Feni town. Peoples can be fall down in disintegrated area and could be serious injured. Study shows the current status of sewerage system in Feni town is not in standard level compared with a model city in developed country. This report shows the clear picture and suggests how to improve the present situation. Therefore, we expect our study open the door for relevant authorities to solve current condition of sewerage system in Feni town and one step forward to be established Feni as a model city in Bangladesh and achieve Millennium Goal Development of Government of Bangladesh.

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